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but few days in the month of April, only seven, yet the aggregate rainfall was about the average for the same month in preceding years. May was in all respects a month of showers: on fourteen of its days rain fell to a greater or less amount; and the total for the month was 5.40 inches. During the same month in 1885, although some rain fell on thirteen days of the thirty-one, but one less day than this year, yet the total rainfall for the month was but 1.86 inches. As will be seen by the chart, the greater part of the rain this year fell on the 8th and 13th insts. An examination of the records for the past seventeen years fails to show such a rainfall during May, the nearest approach being in the year 1882, when 4.20 inches fell. If, however, we continue our search still further back, we shall find a number of years in which this rainfall is surpassed, and in one year, 1846, nearly doubled, it being then 10.25 inches. The highest point reached by the thermometer was 86° F., on the 23d inst., at 5 P.M. On the preceding day the mercury rose to 84° F. at 4 P.M., and on the 30th it reached 85° F. at the same hour of the day.

A NEW EXPEDITION TO ALASKA.

THE New York *Times* has sent an exploring expedition to Alaska, the object of which is to explore the St. Elias range of mountains and the country between them and the sea, while an attempt will be made to ascend Mount St. Elias itself. The expedition is led by Lieut. Frederick Schwatka, who has already won deserved renown in arctic travel and research. In 1879 he led an expedition over the route of Sir John Franklin's party, and brought to the world its fullest and final knowledge of the fate of the *Erebus* and *Terror*. Again, in 1883, he explored from its source to its mouth Alaska's great river, the Yukon. It was in returning from this trip that Lieutenant Schwatka conceived the desire to visit the mountainous and forbidding southern coast of Alaska, and tell the world something of its Indian races, of its forests, its soil, and its glaciers. The *Times* has given him an opportunity to undertake this voyage of discovery and description, and it hopes in due time to lay before the public such additions to the world's present slight knowledge of this region as will amply justify the effort and the expense involved.

Lieutenant Schwatka himself has an article in a recent number of the *Times*, in which he says:—

"The New York *Times* Alaskan exploring expedition, which sailed on the Alaskan steamer *Ancon* from Port Townsend, Washington Territory, June 14, has for its object the exploration of

the almost wholly unknown St. Elias Alps, stretching for nearly 300 miles from the upper part of that picturesque lane of water called 'the inland passage to Alaska' to Mount St. Elias, the highest peak of the North American continent, and which throws its name over the whole range, and even beyond. The expedition, therefore, will have to do with mountain-climbing; and should opportunity present, which is very likely, attempts will be made to ascend, in whole or in part, some of the numerous peaks that project from that high range. Although, strictly speaking, this is not its main object, still it would be considered no small victory to crown the king of the American continent, Mount St. Elias, with shoe-leather of American make, and, but a little way behind this, to reach the summits of any of the others, — Crillon, Fairweather, La Perouse, Vancouver, Lituya, d'Agelet, — all higher than any peak short of the Rocky Mountain range. Should the top of the main range be gained, at 8,000 to 10,000 feet above sea-level, it is hoped — and the probabilities are great — that a bird's-eye view in the interior will compensate for all the trouble taken, and especially if this be done at several points along the main ridge. Bad weather, of course, could defeat much of this part of the plan, but during the summer months this is not very likely. The interior slopes may be descended if the prospect is at all flattering for important research and discovery of any kind; for toward the interior absolutely nothing is known of the country. Prof. William Libbey, jun., professor of physical geography in Princeton college, will have charge of the scientific work, and especially the hypsometrical and topographical part of it. He has been identified with considerable practical Alpine work in the past, both in our own and other countries. The well known hypsometrical and other scientific tables compiled by the late celebrated Professor Guyot (to whose chair at Princeton Professor Libbey succeeded on the former's death), and published by the Smithsonian institution at Washington, were recently revised under Professor Libbey's care, and brought up to the requirements of scientific advancement in that line since Professor Guyot's death. Many of the hypsometrical and other scientific instruments taken were once those of that celebrated geographer."

Of the scientific aims and prospects of the expedition, Lieutenant Schwatka writes as follows:—

"The glacier system of the Mount St. Elias Alps is undoubtedly the most extensive south of the arctic regions themselves. Just how extended it is cannot be told until further exploration gives more data. It will probably be many years before

it is well outlined, as no one exploration could encompass the whole of it. One bay alone has some six or seven glaciers coming down from the southern spurs of these Alaskan Alps just off the summits of Mounts Fairweather and Crillon, which, dipping into the sea, snap off into icebergs that float away nearly as high as the masts of the excursion steamers that visit this bay — called Glacier Bay — monthly during the spring and summer. From Glacier Bay northward to beyond Icy Bay (just seaward from Mount St. Elias) there can be seen these huge rivers of solid ice coming down to the sea; one, Le Grand Plateau, so named by La Perouse, its discoverer, being probably the largest one of the immense group covering so wide a territory. It is quite evident, if the expedition accomplishes any thing, that no small share of it will be in this particular field of research.

"Between the St. Elias Alps and the sea — the Pacific Ocean — is a narrow strip of flat lands where the Indians live, and which, from the ocean, seems to be heavily wooded. It is proposed to find out the status of this timber and that on the foothills of the Alps, as far as it is possible without spending too much time upon it. If fine forests of merchantable timber are found, which is not at all unlikely, it is known that there are good harbors here which will make it quite accessible, and give value to the discovery. If any thing near as valuable as the present yellow cedar forests of the shores of the inland passage of Alaska can be found, the expedition will be a double success from this very fact.

"In the way of precious minerals there is the usual prospect of seeing them; and while the search for them is probably the last on the list of undertakings, if at all, the party will not go by any mountains of gold or silver without at least taking a photograph of them.

"It is hardly to be hoped that the country is much richer in furs than the general average of the Alaska mainland; but, should it fortunately prove otherwise, the public shall know of it in due time.

"Agriculturally there is little to be expected in such a rough Alpine country; but if the low flats known to exist along the coast are not too marshy, and have fertile soil, there is nothing to prevent their being cultivated to the fullest extent, in which case it would be doubly valuable by there being no other agricultural lands near by.

"Of the Indians living here, but very little is known; and this very fact is somewhat in favor of the expedition, as among these little known savages there is every reason to suppose that a rich ethnological collection can be made, which

will not only shed some light on the people themselves, but on adjoining tribes that are somewhat spoiled for ethnological purposes by long contact with white men and civilization."

The exploring party is well supplied with arms and ammunition, as well as with food; and the precise course to be pursued by them is left largely to the discretion of the commander. When the expedition will return depends largely on its success; for Lieutenant Schwatka is determined not to return until he has accomplished something worthy of the expenditure of time and money. He hopes, however, to be back to the Alaskan coast by September of the present year.

ASTRONOMICAL NOTES.

The large dome for the Lick observatory. — At the meeting of the Royal astronomical society on May 14, Mr. Grubb, the well-known Dublin instrument-maker, presented a model of an equatorial mounting and dome which he had designed, at the request of the Lick trustees, for their 36-inch objective. The main idea throughout was to bring under the direct control of the observer all the required motions of the instrument and of the dome, so as to give him as little physical exertion as possible. To effect this the motive power was to be a number of small water-engines, controlled by an electrical apparatus which the observer could carry about with him. A tap on one key will turn the dome in one direction; another will reverse the dome; a third key will control the telescope in right ascension, and another in declination; and so on; while there is one for lighting up the observatory; and lastly, in order that the observer shall have as little difficulty as possible in getting into a position to observe, instead of climbing into a chair which would perhaps require to be twenty-five feet high, a key is provided which will make the whole floor move up or down. During the discussion upon this ingenious device, Mr. Common quoted the following paragraph from Professor Holden in regard to the prospects of completing the observatory: "We hope during the early part of 1887 that we may see the objective, both photographically and visually, completely finished, and perhaps delivered in California. Our large dome will undoubtedly be finished during the current year; and we look forward to commencing serious work with the whole observatory during the year 1887, and possibly sooner." The contracts for the mounting and dome, if any have yet been made by the Lick trustees, are not yet public.

Change of latitude. — Miss Alice Lamb, assistant astronomer at the Washburn observatory, has, in the June number of the *Sidereal messenger*, given